ANSWER KEY & MARKING SCHEME · CBSE CLASS 12

Determination of Income and Employment

Macroeconomics · Chapter 4 · Use this with the Board Paper · Companion to Quick Drill

HOW TO USE

Attempt the Board Paper first (closed-book, full time). Then come here. For 2-mark+ questions, compare your answer to the model. For 3-4 mark questions, also consult the **Topper Templates** below — these show the exact step-by-step structure that scores full marks per CBSE marking-scheme conventions.

MODEL ANSWERS · BOARD PAPER

Section A — VSA (1 mark × 4)

Q1. State the equilibrium condition in the two-sector model. [1 mark]

Ans: Aggregate Demand = Aggregate Supply, i.e., C + I = Y, or equivalently planned saving (S) = planned investment (I).

Q2. Write the formula of the investment multiplier. [1 mark]

Ans: k = 1/(1 − MPC) = 1/MPS.

Q3. If MPC = 0.8, find MPS. [1 mark]

Ans: MPS = 1 − MPC = 1 − 0.8 = 0.2 (since MPC + MPS = 1).

Q4. Define involuntary unemployment. [1 mark]

Ans: Involuntary unemployment is the situation in which workers are willing and able to work at the prevailing wage rate but cannot find employment, typically due to deficient aggregate demand.

Section B — SA-I (3 marks × 2)

Q5. Distinguish between Average Propensity to Consume (APC) and Marginal Propensity to Consume (MPC). [3 marks]

Ans: APC = C/Y (consumption divided by income, an average over the whole income); MPC = ΔC/ΔY (change in consumption per unit change in income, the slope of the consumption curve). APC can exceed 1 at very low income (dis-saving) and falls as income rises; MPC lies strictly between 0 and 1 and is constant for a linear consumption function. Identity: APC + APS = 1 and MPC + MPS = 1.

Q6. If MPC = 0.75 and the increase in investment is ₹200 crore, calculate the increase in equilibrium income. [3 marks]

Ans: MPS = 1 − 0.75 = 0.25. Multiplier k = 1/(1 − MPC) = 1/0.25 = 4. Increase in equilibrium income ΔY = k × ΔI = 4 × ₹200 crore = ₹800 crore.

Section C — SA-II (5 marks × 3)

Q7. Derive the investment multiplier k = 1/(1 − MPC) and explain it with a numerical illustration using MPC = 0.8 and ΔI = ₹100 crore. [5 marks]

Ans: In the two-sector model Y = C + I and C = c^{-} + bY (b = MPC). Substituting: Y = c^{-} + bY + I, so Y(1 − b) = c^{-} + I and Y = (c^{-} + I)/(1 − b). A change in autonomous investment ΔI raises Y by ΔY = ΔI/(1 − b). Hence k = ΔY/ΔI = 1/(1 − MPC) = 1/MPS. With MPC = 0.8: MPS = 0.2, k = 1/0.2 = 5. ΔI = ₹100 crore ⇒ ΔY = 5 × ₹100 = ₹500 crore. Round-by-round: 100 + 80 + 64 + 51.2 + … → ₹500 cr (geometric sum). Higher MPC ⇒ larger multiplier; lower MPC ⇒ smaller multiplier (limit k → ∞ at MPC = 1; k = 1 at MPC = 0).

Q8. Explain the meaning of a DEFLATIONARY gap and discuss any two fiscal and any two monetary measures to correct it. [5 marks]

> **Ans:** A DEFLATIONARY (recessionary) gap is the amount by which Aggregate Demand at the full-employment level of income FALLS SHORT of full-employment Aggregate Supply, leaving the economy below full employment with involuntary unemployment. FISCAL measures (expansionary): (1) INCREASE government expenditure (G) on infrastructure and welfare — directly raises AD and, via the multiplier, lifts income further. (2) CUT direct and indirect taxes — raises households' disposable income, raising consumption (C). MONETARY measures (expansionary): (1) LOWER the repo rate / Bank Rate — cheaper RBI credit lets banks lend more at lower rates, boosting I and durable-goods C. (2) RBI BUYS government securities in OMO (or CUTS CRR/SLR) — injects liquidity into the system, expanding credit through the money multiplier. Together, cheap-money + larger government spending raise AD up to the full-employment level.

Q9. Given C = 40 + 0.8Y and autonomous investment I = ₹60 crore, find the equilibrium level of income. Verify using the saving-investment equality. [5 marks]

> **Ans:** Equilibrium: AD = AS, i.e., Y = C + I. Substitute: Y = 40 + 0.8Y + 60 = 100 + 0.8Y. So Y − 0.8Y = 100 ⇒ 0.2Y = 100 ⇒ Y* = ₹500 crore. Verification via S = I: S = Y − C = Y − (40 + 0.8Y) = −40 + 0.2Y. Set S = I: −40 + 0.2(500) = −40 + 100 = ₹60 cr = I. ✓ Check consumption: C = 40 + 0.8(500) = ₹440 cr, and Y = C + S ⇒ 500 = 440 + 60. ✓ Hence equilibrium income = ₹500 crore.

★ TOPPER ANSWER TEMPLATES

4 TEMPLATES · MEMORISE THE FORMAT

★ TOPPER TEMPLATE — 5-6 mark: 'Derive the investment multiplier and show its working with a numerical.'
2018, 2020, 2022, 2024

Step 1 [1 mark]	**Define + intuition**	The investment multiplier (k) measures the multiple by which equilibrium income (Y) increases for a given increase in autonomous investment (I): k = ΔY/ΔI. Intuition: new investment creates income for factor owners, who spend a fraction (MPC) on consumption, which becomes someone else's income, and the chain continues in shrinking rounds.
Step 2 [2 marks]	**Derivation**	In the two-sector model, Y = C + I and C = $\bar{c}$ + bY where b = MPC. Substituting: Y = $\bar{c}$ + bY + I, so Y(1 - b) = $\bar{c}$ + I, giving Y = ($\bar{c}$ + I)/(1 - b). A change in autonomous investment ΔI raises Y by ΔY = ΔI/(1 - b). Therefore k = ΔY/ΔI = 1/(1 - MPC) = 1/MPS.
Step 3 [2 marks]	**Numerical**	Suppose MPC = 0.8 and ΔI = ₹100 crore. Then MPS = 1 - 0.8 = 0.2 and k = 1/0.2 = 5. So ΔY = k × ΔI = 5 × ₹100 cr = ₹500 crore. Round-by-round: Round 1 ΔY = 100, Round 2 = 80 (= 0.8 × 100), Round 3 = 64, Round 4 = 51.2, ... summing to ₹500 cr.
Step 4 [1 mark]	**Limits + conclusion**	The multiplier is LIMITED by the MPC: higher MPC → larger k (more re-spending), lower MPC → smaller k. The maximum value of k is infinity (MPC = 1, all is spent), the minimum is 1 (MPC = 0, none re-spent). Thus the multiplier shows how a small autonomous push can produce a much larger change in equilibrium income.

COMMON LOSS OF MARKS:

- Writing k = 1/MPC instead of 1/(1 - MPC).
- Arithmetic: 1/(1 - 0.8) must equal 5, not 4.
- Skipping the derivation step and jumping to the numerical.
- Not stating the MPS link k = 1/MPS.

★ TOPPER TEMPLATE — 5-mark: 'Explain deflationary and inflationary gaps with corrective measures.'

2019, 2021, 2023

Step 1 [1 mark]	**Define both gaps**	DEFLATIONARY (recessionary) GAP = the amount by which AD at FULL EMPLOYMENT falls short of full-employment AS, leaving the economy below full employment with involuntary unemployment. INFLATIONARY GAP = the amount by which AD exceeds full-employment AS, pushing up the general price level without increasing real output.
Step 2 [2 marks]	**Deflationary gap remedies**	Expansionary FISCAL policy: increase government expenditure (G) on infrastructure/ welfare, CUT direct and indirect taxes, increase transfer payments — all raise disposable income and AD. Expansionary MONETARY policy: LOWER the repo rate, CUT CRR and SLR, RBI BUYS government securities (OMO) — all increase money supply, lower interest rates, and raise investment and consumption.
Step 3 [2 marks]	**Inflationary gap remedies**	Contractionary FISCAL policy: REDUCE government expenditure, RAISE taxes, cut transfers — to cool AD. Contractionary MONETARY policy: RAISE the repo rate, RAISE CRR and SLR, RBI SELLS government securities — to absorb money, raise interest rates, and curb borrowing/spending. The aim is to bring AD back down to the full-employment level without crashing output.

COMMON LOSS OF MARKS:

- Reversing the direction of fiscal/monetary remedies.
- Listing only fiscal OR only monetary — examiner expects both.
- Not anchoring the gaps to FULL-EMPLOYMENT level of AS.
- Confusing deflationary gap with deflation (a price-fall episode).

★ TOPPER TEMPLATE — 3-mark: 'Distinguish APC and MPC (or APS and MPS).'

Most years

Step 1 [1 mark]	**Definitions**	APC = C/Y (average — total consumption divided by total income). MPC = $\Delta C/\Delta Y$ (marginal — change in consumption per unit change in income). APS = S/Y; MPS = $\Delta S/\Delta Y$.
Step 2 [1 mark]	**Range and link to graph**	APC can be GREATER than 1 at very low income (when households dis-save to consume more than they earn) and falls as income rises. MPC is the SLOPE of the consumption function and lies strictly between 0 and 1. MPC is constant for a linear consumption function; APC is not.
Step 3 [1 mark]	**Identity**	APC + APS = 1 (every rupee of income is either consumed or saved) and MPC + MPS = 1 (every additional rupee of income is either consumed or saved). These identities are used in almost every numerical.

COMMON LOSS OF MARKS:

- Saying MPC > 1 (it cannot be).
- Not stating the identity MPC + MPS = 1.
- Defining only APC or only MPC instead of distinguishing.

★ TOPPER TEMPLATE — 3-mark: 'State the equilibrium condition in the two-sector model and find equilibrium Y.'

2018, 2021, 2024

Step 1 [1 mark]	**Equilibrium condition**	Equilibrium occurs where Aggregate Demand = Aggregate Supply, i.e., C + I = Y, or equivalently planned SAVING = planned INVESTMENT (S = I).
Step 2 [1 mark]	**Set-up**	Given $C = \bar{c} + bY$ and autonomous I, $AD = \bar{c} + bY + I$. Set AD = Y: $\bar{c} + bY + I = Y$, so $Y(1 - b) = \bar{c} + I$.
Step 3 [1 mark]	**Solve + numerical check**	$Y^* = (\bar{c} + I)/(1 - b)$. Example: $\bar{c}$ = ₹40 cr, I = ₹60 cr, b = MPC = 0.8 ⇒ $Y^* = (40 + 60)/(1 - 0.8) = 100/0.2$ = ₹500 cr.

COMMON LOSS OF MARKS:

- Writing the equilibrium condition as C = I.
- Arithmetic errors in 1 - b.
- Not stating the equivalent S = I form.

MARKING SCHEME — GENERAL NOTES

- Multiplier numerical: full marks need k = 1/(1 − MPC) written explicitly, the arithmetic (1/0.2 = 5), and $\Delta Y = k \times \Delta I$.
- Gap remedies: award marks only if BOTH fiscal AND monetary measures are named with the correct direction.
- Equilibrium answers must state AD = AS ⇔ S = I (planned); C = I is wrong.
- Use precise vocabulary (autonomous consumption $\bar{c}$, MPC, MPS, ex-ante, full-employment AS); conclude 5-markers with a check or summary line.